

**USACE Hopper Dredging Interactions with Sea Turtles
and Shortnose Sturgeon:
Fiscal Year 10 Annual Summary Report
For the South Atlantic Region
Of the USACE South Atlantic Division**

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FINAL REPORT



BACKGROUND

This report summarizes data collected for dredging interactions with sea turtles during USACE hopper dredging operations throughout the South Atlantic Region in Fiscal Year (FY) 2010 (1 October 2009 through 30 September 2010). Data were collected by contracted observer companies as part of the Endangered Species Observer Program administered by the USACE Districts Jacksonville, Savannah, Charleston, and Wilmington as specified and mandated by the South Atlantic Regional Biological Opinion (SARBO) (issued by the Southeast Region National Marine Fisheries Service on 25 November 1991 and revised 25 August 1995 (Revision 1) and 25 September 1997 (Revision 2) and the USACE SARBO Management Protocol (USMP) (issued by the USACE South Atlantic Division in FY 2003). These data are for hopper (trailing-suction style) dredging projects only and do not include non-hopper (i.e. clamshell bucket, cutterhead) dredging projects. Non-hopper dredges are not monitored for sea turtle entrainments since the mechanical operation of these dredges has been identified as having minimal or no risk to sea turtles (SARBO). Hopper dredges were used instead of non-hopper dredges for the projects presented in this report due to factors related to crew/vessel safety, sea and weather conditions, project configurations, and productivity costs. This report provides a regional summary of hopper dredging-related incidental takes and trawling-related captures/relocations of sea turtles within the south Atlantic region of the USACE South Atlantic Division.

METHODS AND DATA SOURCES

Appendix A provides a map designating the 9 locations for the 9 USACE hopper dredging projects in the South Atlantic during FY 2010 by USACE District and geographic subregion. The USACE Districts Jacksonville, Savannah, Charleston, and Wilmington were responsible for implementing these hopper dredging projects and for complying with the environmental requirements designated by the SARBO and the USMP (i.e., use of deflectors, 100% observer coverage, relocation trawling). Due to potential differences in habitat use by sea turtles and differences in dredging environments, the South Atlantic region was divided into 2 subregions (South Atlantic (SA) and Central Atlantic (CA) for some data presented in this report. The dividing boundary for these two subregions is the coastal border between Georgia and South Carolina. These subregions are consistent with those presented in Dickerson et al. 2007 to allow continuity in data comparisons.

Data summarized in this report were compiled from individual project summary reports and the annual hopper dredging reports on sea turtle interactions for FY2010 submitted by the USACE SAD Districts Jacksonville, Savannah, Charleston, and Wilmington as well as the Endangered Species Observer Reports submitted by each of the contracted observer companies. Reports are electronically linked within the reference section of this document. These report, along with individual data profiles for each documented sea turtle incidental take, protocols for mitigation efforts and data collection, and links to the SARBO and USMP are archived for reference on the USACE Sea Turtle Data Warehouse website: (<http://el.erdc.usace.army.mil/seaturtles/>).

RESULTS

During FY 2010, 9 hopper dredging projects (8 civil works (CW) channel/harbor maintenance, 1 CW beach nourishment and 1 regulatory (R) beach re-nourishment) were conducted along the South Atlantic. A total of 6 sea turtles were incidentally taken during these. Non capture sweep trawling was performed during 2 CW projects (1 channel/harbor maintenance and 1 beach renourishment). Both these projects with sweep trawling also had capture trawling performed. All summaries for these data are provided in the following appendices.

REFERENCES AND RESOURCES

USACE Sea Turtle Database Warehouse, (<http://el.erdc.usace.army.mil/seaturtles/>).

Dickerson, D., C. Theriot, M. Wolters, C. Slay, T. Bargo, W. Parks. 2007. "[Effectiveness of relocation trawling during hopper dredging for reducing incidental take of sea turtles](#)," *In: Proceedings of the World Dredging Congress XVIII, USACE ERDC Research Initiatives*. Central Dredging Association, 27 May-1 June 2007, Lake Buena Vista, Florida.

Dickerson, D. D., M. S. Wolters, C. T. Theriot, C. Slay. 2005. "[Dredging impacts on sea turtles in the Southeastern USA: A historical review of protection](#)," *In: Proceedings of the World Dredging Conference XVII, Dredging in a Sensitive Environment*. Central Dredging Association, 27 September-1 October 2004, Hamburg, Germany.

[South Atlantic Regional Biological Opinion \(SARBO\). 1991.](#)

[South Atlantic Regional Biological Opinion \(SARBO\). 1995 revision.](#)

[South Atlantic Regional Biological Opinion \(SARBO\). 1997 revision.](#)

[USACE South Atlantic SARBO Management Protocol.](#)

FY 2010 Project Sea Turtle/Dredging Data Submitted by Endangered Species Observer Companies and USACE Districts (Archived at <http://el.erdc.usace.army.mil/seaturtles/>)

[USACE Jacksonville District \(FY 2010\)](#)

[Palm Beach Harbor Entrance Channel, O&M](#) (Coastwise Consulting, Inc.)

[Juno Beach Re-Nourishment](#) (East Coast Observers, Inc.)

[Brevard County Beach Nourishment](#) (Coastwise Consulting, Inc.)

[Kings Bay Entrance Channel](#) (Coastwise Consulting, Inc.)

Savannah District

Brunswick Harbor Bar Channel, (Coastwise Consulting, Inc.)

Savannah Harbor Bar Channel, (Coastwise Consulting, Inc.)

Charleston District

Charleston Harbor (Coastwise Consulting, Inc.)

Wilmington Harbor

Wilmington Harbor Ocean Bar, (Coastwise Consulting, Inc.)

Carolina Beach, Kure Beach and Ocean Isle Beach – Renourishment, (Coastwise Consulting, Inc.)

APPENDICES

Appendix A.....	Map of FY10 South Atlantic Region Hopper Dredging Projects
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APPENDIX A
FY10 South Atlantic Region Hopper Dredging Projects



South Atlantic (SA)

1. Palm Beach Harbor (SAJ)
2. Juno Beach Re-Nourishment (SAJ)
3. Brevard County (SAJ)
4. Kings Bay Channel (SAJ)
5. Brunswick Harbor (SAS)
6. Savannah Harbor (SAS)

Central Atlantic (CA)

7. Charleston Harbor (SAC)
8. Wilmington Harbor Ocean Bar (SAW)
9. Carolina Beach, Kure Beach and Ocean Isle Beach – Re-nourishment (SAW)

Key

SAJ = USACE Jacksonville District

SAS = USACE Savannah District

SAC = USACE Charleston District

SAW = USACE Wilmington District

APPENDIX B-1
Incidental Take Limits Designated by the
South Atlantic Region Biological Opinion

<i>FY10 Incidental Take Limits as stated in the South Atlantic Biological Opinion (1997) for Hopper Dredges</i>				
Loggerhead <i>(Caretta caretta)</i>	Green <i>(Chelonia mydas)</i>	Kemp's ridley <i>(Lepidochelys kempii)</i>	Hawksbill <i>(Eretmochelys imbricata)</i>	Shortnose Sturgeon <i>(Acipenser brevirostrum)</i>
35	7	7	2	5

APPENDIX B-2
FY 2010 Documented Summary of Incidental Takes, Relocated Turtles, and
Shortnose Sturgeon

<i>FY10 Incidental Takes for the South Atlantic Region</i>				
Loggerhead <i>(Caretta caretta)</i>	Green <i>(Chelonia mydas)</i>	Kemp's ridley <i>(Lepidochelys kempii)</i>	Hawksbill <i>(Eretmochelys imbricata)</i>	Shortnose Sturgeon <i>(Acipenser brevirostrum)</i>
1	4	1	0	0

<i>FY10 Relocated Turtles and Sturgeon for South Atlantic Region</i> <i>Non relocated- Non Capture Sweep Trawling Performed</i>			
Sea Turtle Relocations	Sea Turtle (any species) Relocation Takes (injured or killed)	Shortnose Sturgeon Relocations	Shortnose Sturgeon Relocation Takes (injured or killed)
18	0	0	0

APPENDIX C
Dredging Project Summary Data
(FY10 South Atlantic Region Hopper Dredging)

District	Sub-region	Project	Project Type	Dredge	# Drag-heads	Dredge Dates**	Total Dredge Days**	Total Y ³ [^] Dredged***	Total M ³ [^] Dredged***	Observer Co.
SAJ	SA	Palm Beach Harbor	C/CLN	<i>Dodge Island</i>	2	12/27/09-12/27/09	1	64,068	48,984	REMSA
SAJ	SA	Juno Beach Re-Nourishment	O/BD	<i>RN Weeks</i>	2	12/19/09 – 1/8/10; 1/11/10 – 3/26/10	96	1,234,697	943,994	ECO
SAJ	SA	Brevard County Beach Nourishment	O/BD	<i>Liberty Island</i>	2	2/13/10 – 3/2/10 3/22/10 – 4/17/10	45	636,411	486,571	REMSA
SAJ	SA	Kings Bay Entrance Channel	M/C/O/BD	<i>Terrapin Island Liberty Island</i>	2/2	12/5/09 - 12/8/09 12/9-09 - 12/27/09; 1/5/10 - 2/11/10	4 49	1,348,247	1,030,809	ECO
SAJ	SA	Brunswick Harbor Entrance Channel	M/C/NSB	<i>Bayport Glenn Edwards</i>	2/2	1/26/10 – 3/4/10 2/3/10 – 2/25/10	38 23	1,728,339	1,321,410	CWC
SAS	SA	Savannah Harbor Entrance Channel	M/C/NSB	<i>Bayport</i>	2	3/5/10 – 3/29/10	24	510,036	389,951	CWC
SAC	CA	Charleston Harbor Entrance Channel	M/C/OD	<i>Glenn Edwards</i>	2	2/26/10 – 3/17/10	20	1,444,703	1,104,555	CWC
SAW	CA	Carolina Beach, Kure Beach and Ocean Isle Beach – Re-nourishment	BD	<i>Liberty Island</i>	2	3/4/10 – 3/20/10	17	446,967	341,731	CWC
SAW	CA	Wilmington Harbor Outer Ocean Bar	M/C/OD	<i>Dodge Island</i>	2	2/9/10 – 4/5/10	56	1,004,359	767,888	CWC

M = Maintenance; ED = Emergency dredging; C = Channel sediment source; O = Offshore/non-channel sediment source; OD = Ocean disposal; BD = Beach disposal; NSB = Near Shore Feeder Berm; CLN = Clean Up from previous project

ECO = East Coast Observers, Inc.; CWC = Coastwise Consultants, Inc.; REMSA = Research, Environmental & Management Support

*Data included only for projects that occurred in FY10. Project started work in FY09 but finished in FY10. Cubic yards not separated out by FY so yards are estimates.

**Project and dredge dates include non-dredging down time unless actual dredge days are reported with known breaks/down time.

***Dredge quantities (provided by USACE Districts) may be estimates or paid instead of actual amounts

[^]Y³ = Total Cubic Yards; M³ = Total Cubic Meters.

Gray shaded = Regulatory project

APPENDIX D
Distribution of Sea Turtle Incidental Takes by Species
(FY10 South Atlantic Region Hopper Dredging)

District	Sub-Region	Project	Dredge	Cc	Cm	Lk	Total Takes
SAJ	SA	Palm Beach Harbor	<i>Dodge Island</i>	0	0	0	0
SAJ	SA	Juno Beach Re-Nourishment	<i>Padre Island</i>	0	0	1	1
SAJ	SA	Brevard County Beach Nourishment	<i>Liberty Island</i>	0	0	0	0
SAJ	SA	Kings Bay Entrance Channel	<i>Terrapin Island (1cc)</i> <i>Liberty Island (4 cm)</i>	1	4	0	5
SAS	SA	Brunswick Harbor Entrance Channel	<i>Bayport</i> <i>Glenn Edwards</i>	0	0	0	0
SAS	SA	Savannah Harbor Entrance Channel	<i>Bayport</i>	0	0	0	0
SAS	CA	Charleston Harbor Entrance Channel	<i>Glenn Edwards</i>	0	0	0	0
SAC	CA	Carolina Beach, Kure Beach and Ocean Isle Beach – Re-nourishment	<i>Liberty Island</i>	0	0	0	0
SAW	CA	Wilmington Harbor Ocean Bar	<i>Dodge Island</i>	0	0	0	0
TOTAL				1	4	1	6
Cc = Loggerhead (<i>Caretta caretta</i>); Cm = Green turtle (<i>Chelonia mydas</i>); Lk = Kemp's Ridley (<i>Lepidochelys kempii</i>) *Data included only for projects that occurred in FY10. Gray shaded = Regulatory project							

APPENDIX E
Hopper Dredge/Non-Capture Trawler-related Incidental Take Summary
(FY10 South Atlantic Region Hopper Dredging)

District	Sub-region	Project	Species	Take Date	Dredge Load #	Time Recovered	Lat	Long	Water Temp*	SI used?	Trawling used?
SAJ	SA	Kings Bay Channel	Cc	12/6/09	3	1045	30' 42.714	81' 21.721	16.8	Yes	No
			Cm	12/13/09	7	1950	30' 42.597	81' 25.142	17.8	Yes	No
			Cm	12/16/09	15	0335	30' 42.681	81' 22.723	17.0	Yes	No
			Cm	12/22/09	37	0242	30' 42.654	81' 24.605	14.5	Yes	Yes+
			Cm	12/27/09	46	1920	30' 42.646	81' 22.501	13.0	Yes	Yes+
SAJ	SA	Juno Beach Re-nourishment	Lk	1/8/10	103	0915	26' 49.700	80' 01.560	23.3	Yes	No
Cc = Loggerhead (<i>Caretta caretta</i>); Cm = Green turtle (<i>Chelonia mydas</i>); Lk = Kemp's ridley (<i>Lepidochelys kempi</i>) SI used? = Silent Inspector in use during dredging project? * Method and location in water column more than likely surface temp. † Non-capture trawling performed starting in Kings Bay on 12/14/09 but down cause of bad weather on 12/16 – 12/18/09. Observer recorded lat/long of turtle takes are either the beginning, middle, or end of the load. Usually the beginning of the load (Chris Slay from Coastwise Consulting). Gray shaded = Regulatory project											

APPENDIX F
Capture Relocation Trawling Summary Data
(FY10 South Atlantic Region Hopper Dredging)

District	Sub-Region	Project	Trawl Vessel	Trawl Dates	Total Trawl Days	Total Tows	Cc	Cm	Lk	Dc	Total Relocated	Avg. Tows/Day	Observer Co.
SAJ	SA	Palm Beach Harbor	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAJ	SA	Juno Beach Re-Nourishment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAJ	SA	Brevard County Beach Nourishment	Lady Paige	4/1/10 – 4/17/10	17	419	16	0	0	2	18	24.65	CWC
SAJ	SA	Kings Bay Channel	*Reilly Morgan Catina Renea	1/4/10 – 2/1/10 2/2/10 – 2/11/10	39	992	0	0	0	0	0	25.44	CWC
SAS	SA	Brunswick Harbor Entrance Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAS	SA	Savannah Harbor Entrance Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAS	CA	Charleston Harbor Entrance Channel	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAW	CA	Carolina Beach, Kure Beach and Ocean Isle Beach – Re-nourishment	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
SAW	CA	Wilmington Harbor Ocean Bar	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
TOTAL TURTLES RELOCATED BY SPECIES							16	0	0	2	18	25.20	
Cc = Loggerhead (<i>Caretta caretta</i>); Cm = Green turtle (<i>Chelonia mydas</i>); Lk = Kemp's ridley (<i>Lepidochelys kempii</i>)													
N/A = Not Applicable since relocation did not occur during that project													
Gray shaded = Regulatory project													
*29 Atlantic Sturgeon captured/relocated by F/V Reilly Morgan. All but 28 was captured in January and 1 on Feb 1.													
ECO = East Coast Observers, Inc.; CWC = Coastwise Consultants, Inc.													

APPENDIX G

Dredging Project Summary Data by Subregion and USACE District (FY10 South Atlantic Region Hopper Dredging)

Dredging Data Summary	Subregion		
	South Atlantic	Central Atlantic	TOTAL
Total Dredge Projects	6	3	9
Total Turtle Takes	6	0	6
Total Dredge Days	280	93	373
Total Turtle Takes/Days Dredged	0.0214	0.0000	0.0161
Total Cubic Yards	5,521,798	2,896,029	8,417,827
Total Cubic Meters	4,221,717	2,214,173	6,435,891
Total Turtle Takes/1000-y ³	0.00109	0.0000	0.00071
Total Turtle Takes/1000-m ³	0.00142	0.0000	0.00093

Dredging Summary Data	USACE District				
	Jacksonville	Savannah	Charleston	Wilmington	Total
Total Dredge Projects	4	2	1	2	9
Total Turtle Takes	6	0	0	0	6
Total Dredge Days	195	85	20	73	373
Total Turtle Takes/Days Dredged	0.0309	0.0000	0.0000	0.0000	0.0161
Total Cubic Yards	3,283,423	2,238,375	1,444,703	1,451,326	8,417,827
Total Cubic Meters	2,510,357	1,711,360	1,104,555	1,109,618	6,435,891
Total Turtle Takes/1000-y ³	0.00183	0.0000	0.0000	0.0000	0.00071
Total Turtle Takes/1000-m ³	0.00239	0.0000	0.0000	0.0000	0.00093

APPENDIX H

Relocation Trawling Summary Data by Subregion and USACE District (FY10 South Atlantic Region Hopper Dredging)

Relocation Trawling Summary Data	Subregion		
	South Atlantic	Central Atlantic	TOTAL
Total Trawl Projects	2	N/A	2
Total Turtles Relocated	18	N/A	18
Total Trawl Days	56	N/A	56
Total Tows	1411	N/A	1411
Total Turtles Trawled/Total Days	0.3214	N/A	0.3214
Total Turtles Trawled/Total Tows	0.0128	N/A	0.0128
Average Tows per day	25.20	N/A	25.20

N/A = No relocation trawling performed.

Relocation Trawling Summary Data	USACE District				
	Jacksonville	Savannah	Charleston	Wilmington	Total
Total Trawl Projects	2	N/A	N/A	N/A	2
Total Turtles Relocated	18	N/A	N/A	N/A	18
Total Trawl Days	56	N/A	N/A	N/A	56
Total Tows	1411	N/A	N/A	N/A	1411
Total Turtles Trawled/Total Days	0.3214	N/A	N/A	N/A	0.3214
Total Turtles Trawled/Total Tows	0.0128	N/A	N/A	N/A	0.0128
Average Tows per day	25.20	N/A	N/A	N/A	25.20

N/A = No relocation trawling performed.

APPENDIX I

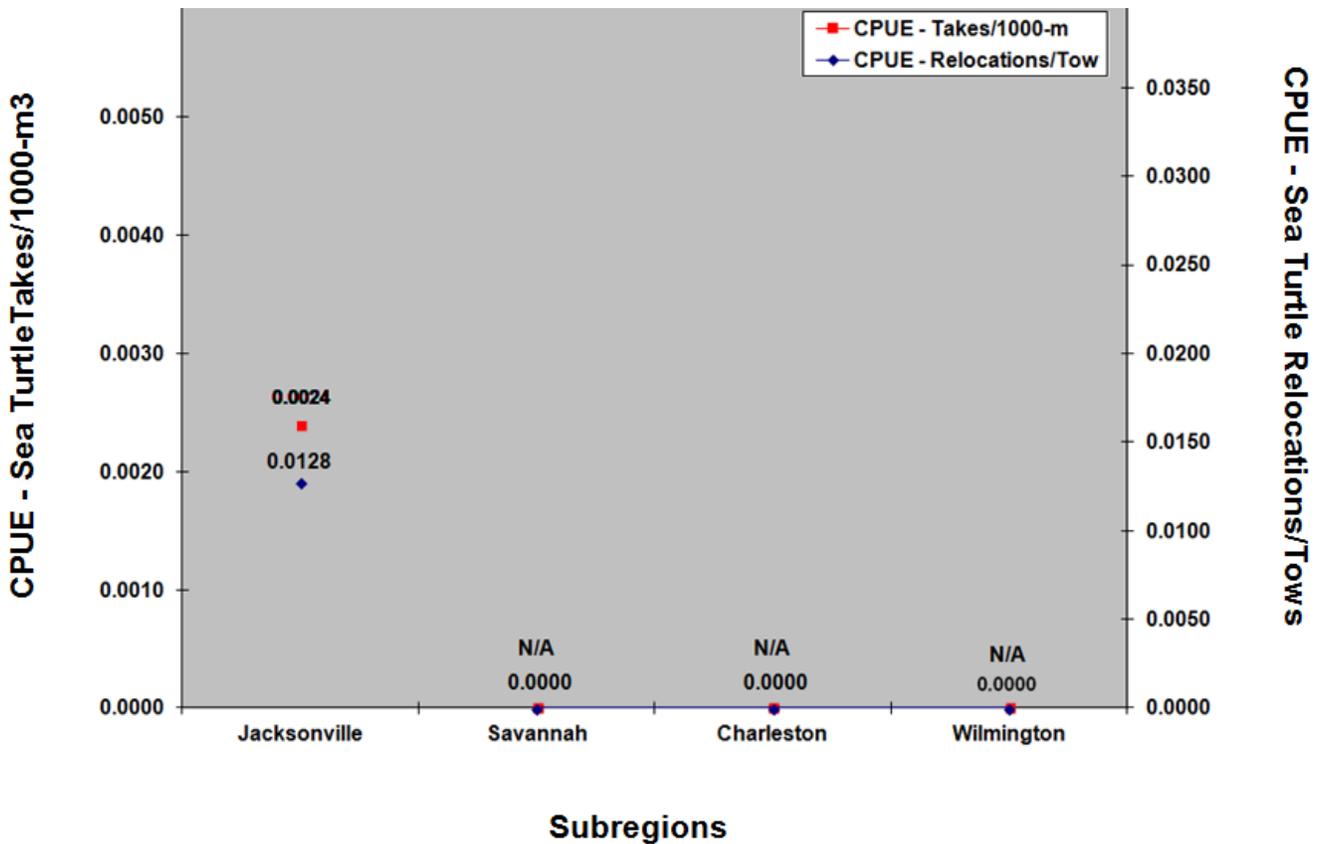
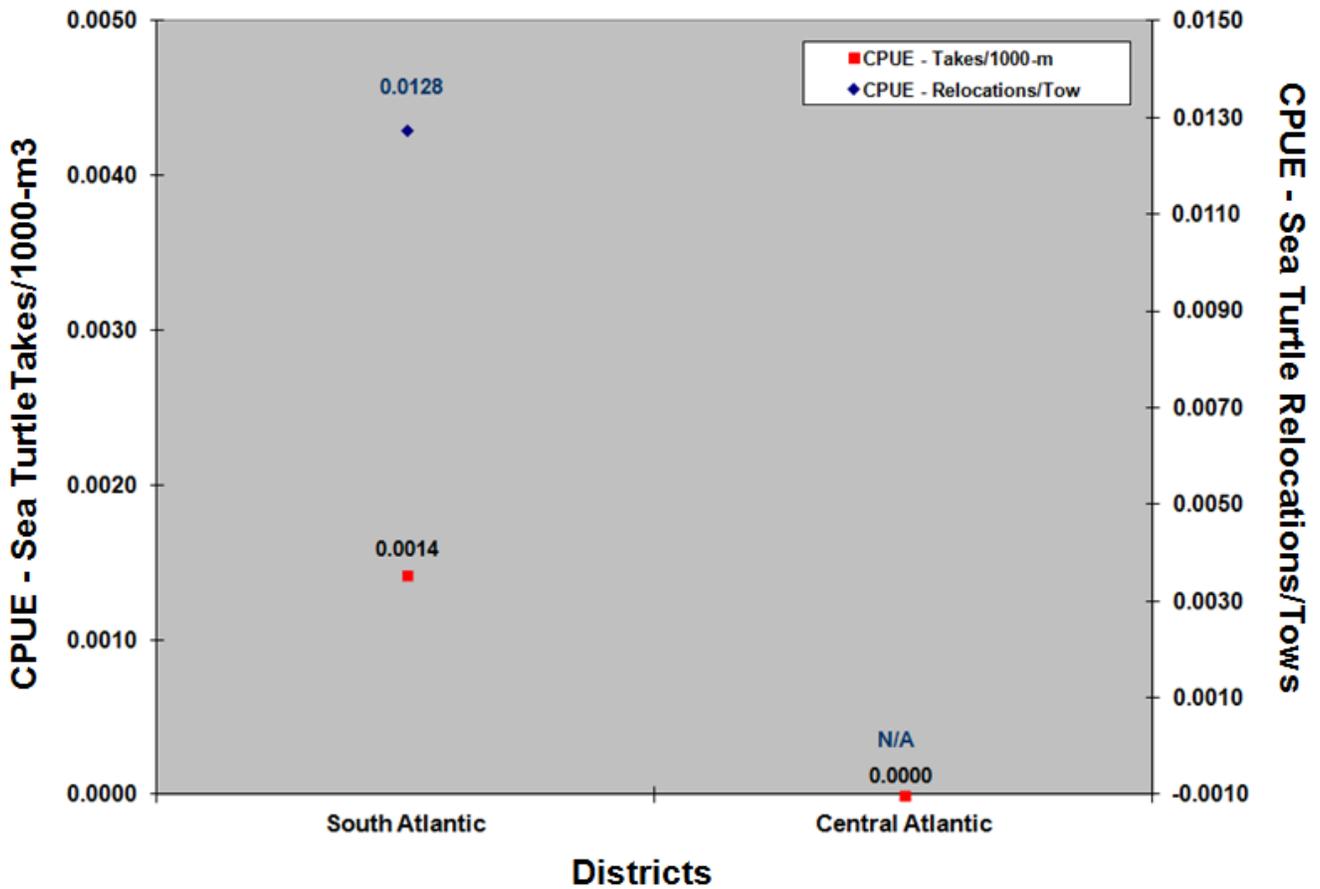
Non-Capture Sweep Trawling Summary Data by District (FY10 South Atlantic Region Hopper Dredging)

Relocation Trawling Summary Data	USACE District				
	Jacksonville	Savannah	Charleston	Wilmington	Total
Total Sweep Projects	2	N/A	N/A	N/A	2
Total Sweep Days	21	N/A	N/A	N/A	21
Total Tows	118	N/A	N/A	N/A	118
Total Sweeps	994	N/A	N/A	N/A	994

N/A = No non-capture sweep trawling performed.

APPENDIX J

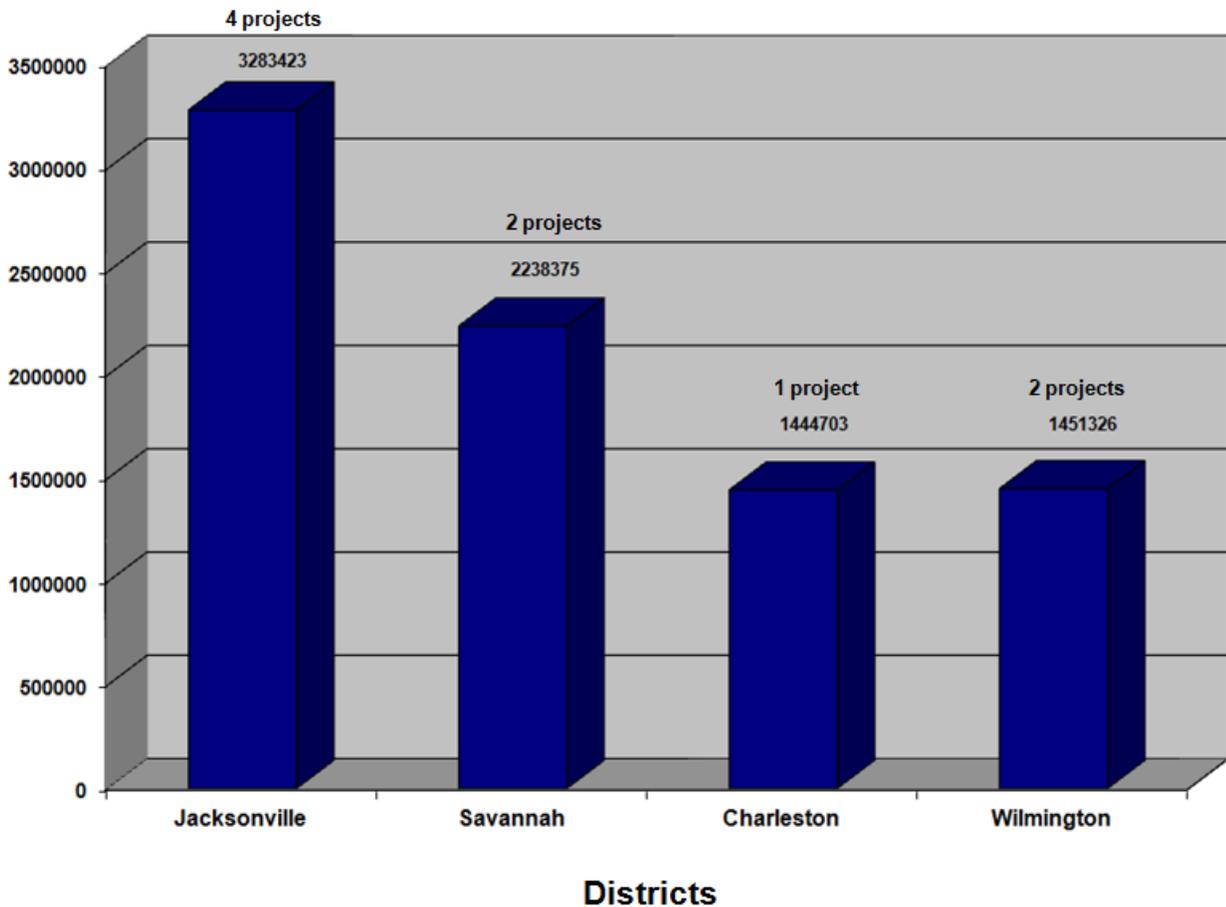
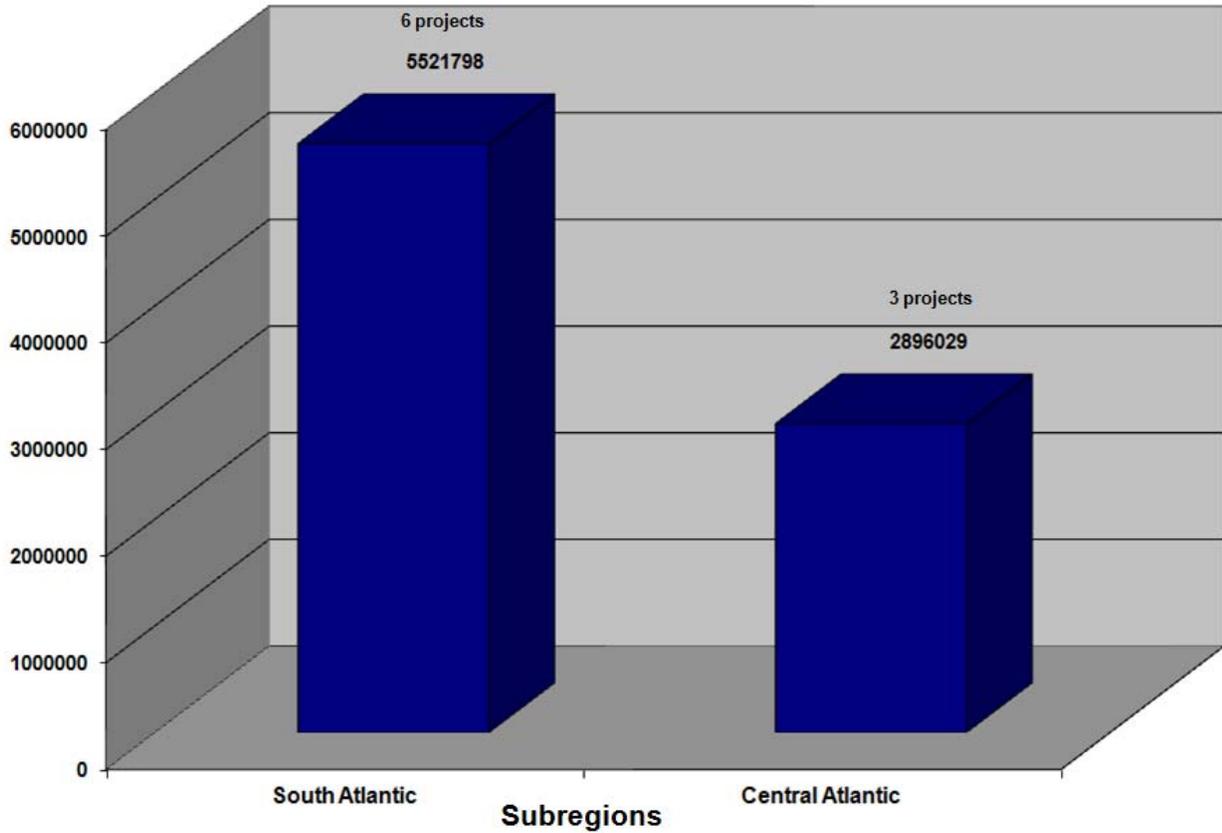
Catch per Unit Effort Comparisons for Sea Turtle Dredge Takes and Trawl Relocations by Subregion and USACE District (FY10 South Atlantic Region Hopper Dredging)



APPENDIX K

Distribution of Dredged Material Quantities (Cubic Yards) by Geographic Subregion and USACE Districts

(FY10 South Atlantic Region Hopper Dredging)



APPENDIX L
Distribution of Sea Turtle Takes by Month
(FY10 South Atlantic Region Hopper Dredging)

PROJECT	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Palm Beach Harbor												
Juno Beach Re-Nourishment	1											
Brevard County Beach Nourishment												
Kings Bay Entrance Channel												5
Brunswick Harbor Entrance Channel												
Savannah Harbor Entrance Channel												
Charleston Harbor Entrance Channel												
Carolina Beach, Kure Beach and Ocean Isle Beach – Re-nourishment												
Wilmington Harbor Ocean Bar												
TOTAL LOGGERHEAD TAKES	0	0	0	0	N/A	1						
TOTAL GREEN TURTLE TAKES	0	0	0	0	N/A	4						
TOTAL KEMP'S RIDLEY	1	0	0	0	N/A	0						
TOTAL TURTLE TAKES BY MONTH	1	0	0	0	N/A	5						
TOTAL PROJECTS BY MONTH	3	4	3	1	N/A	3						
Cc = Loggerhead (<i>Caretta caretta</i>); Cm = Green turtle (<i>Chelonia mydas</i>); Lk = Kemp's ridley (<i>Lepidochelys kempfi</i>) Shaded areas = project occurrence (projects under 5 days in one month not included unless turtle take occurred). Gray shaded Project = Regulatory project Palm Beach Harbor 1 only worked 1 day in December and no turtles but in this case represents a whole project.												

APPENDIX M
Distribution of Project Dredge Days by Month
(FY10 South Atlantic Region Hopper Dredging)

PROJECT	DREDGE	JAN	FEB	MAR	APR	MAY	JUN	JUL	AUG	SEP	OCT	NOV	DEC
Palm Beach Harbor Entrance Channel	<i>Dodge Island</i>												1
Juno Beach Re-Nourishment	<i>R.N. Weeks</i>	29	28	26									13
Brevard County Beach Nourishment	<i>Liberty Island</i>		16	12	17								
Kings Bay Entrance Channel	<i>Terrapin Island Liberty Island</i>	0/19	0/11										4/19
Brunswick Harbor Entrance Channel	<i>Glenn Edwards/ Bayport</i>	0/6	23/28	0/4									
Savannah Harbor Entrance Channel	<i>Bayport</i>			24									
Charleston Harbor Entrance Channel	<i>Glenn Edwards</i>		3	17									
Carolina Beach, Kure Beach and Ocean Isle Beach	<i>Liberty Island</i>			17									
Wilmington Harbor Ocean Bar	<i>Dodge Island</i>		20	31	5								
TOTAL DAYS DREDGED BY MONTH		54	129	131	22								37
TOTAL TURTLE TAKES BY MONTH		1	0	0	0								5
TURTLES TAKES PER DREDGE DAY BY MONTH		0.0185	0	0	0								0.0549

Shaded areas = Project occurrence (projects under 5 days in one month not included unless turtle take occurred). Gray shaded Project = Regulatory project.
Palm Beach Harbor 1 only worked 1 day in June and no turtles but in this case represents a whole project.

APPENDIX N
Non-Sea Turtle Species Incidental Takes or Noted Occurrences
(FY10 South Atlantic Region Hopper Dredging)

Species	Project	Observations/Remarks
Sturgeon	Brunswick Harbor Kings Bay Harbor	-Atlantic Sturgeon taken by dredge Bayport Load #193 & #194, 2 more taken by Glenn Edwards on 2/6 and 2/7/10. Only found in observer reports. (Brunswick). -29 Atlantic Sturgeon captured/relocated by F/V Reilly Morgan. All but 28 was captured in January and 1 on Feb 1.
Whales/Manatees	Kings Bay Harbor Juno Beach Brevard County Brunswick Harbor Wilmington Harbor	-One sighting of pygmy sperm whale. -A right whale observed at beach pump out. -Two sightings of right whales and two sightings of humpbacks. -2 adults Right Whale spotted on load #28 heading to dump,aerial. - Right Whale sighted
Dolphin	Kings Bay Harbor Brevard County Brunswick Harbor Savannah Harbor Carolina Beach	-Bottlenose dolphins frequently sighted. - Bottlenose dolphins frequently sighted. --~20 dolphins spotted – Bayport -Some dolphin sightings mentioned by Bayport -1 sighting of dolphin sighted
Shark	Kings Bay Harbor Brunswick Harbor Savannah Harbor Carolina Beach Wilmington Harbor	-Sand shark in dredge -9 Atlantic shortnose and 1 dogfish – Bayport -14 Atlantic shortnose taken by dredge and 1 unidentified -8 dogfish and 10 more listed just as shark -Spiny dogfish mentioned on many dailies but no numbers
Horseshoe Crab	Kings Bay Harbor Brunswick Harbor Savannah Harbor Charleston Harbor Carolina Beach Wilmington Harbor	--~1525 reported HS crab found in dredge for 127 loads. --~1657 reported by Bayport for 264 loads.~1600 reported by Glenn Edwards for 142 loads. - ~3650 reported for 154 loads. -Mention of HS takes but no numbers given -120 reported for 104 loads - Mention of HS takes but no numbers given